

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

**(19) World Intellectual Property Organization
International Bureau**



**(43) International Publication Date
21 July 2005 (21.07.2005)**

PCT

(10) International Publication Number
WO 2005/067189 A1

(51) International Patent Classification⁷: H04K 1/00

(21) International Application Number: PCT/US2004/040991

(22) International Filing Date: 8 December 2004 (08.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/531,724 22 December 2003 (22.12.2003) US

(71) Applicant (for all designated States except US): MAGIQ TECHNOLOGIES, INC. [US/US]; 275 Seventh Avenue, 26th Floor, New York, NY 10001 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): TRIFONOV, Alexei [RU/US]; 69 Park Drive #8, Boston, MA 02215 (US). ZAVRIYEV, Anton [US/US]; 468 Humphrey St., Swampscott, MA 01907 (US). SUBACIUS, Darius [US/US]; 85 Reedy Meadow Rd., Groton, MA 01450 (US).

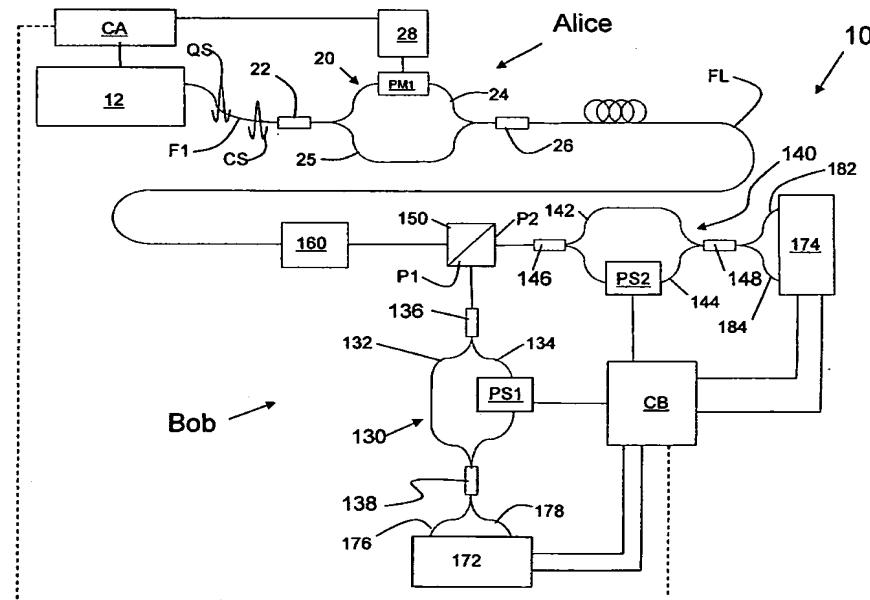
(74) Agent: GORTYCH, Joseph, E.; c/o Magiq Technologies, Inc., 275 Seventh Avenue, 26th Floor, New York, NY 10001 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: ACTIVE STABILIZATION OF A ONE-WAY QKD SYSTEM



(57) Abstract: A one-way stabilized QKD system (10) that utilizes a control signal (CS) and a quantum signal (QS) that travel the same path through the system from a first QKD station (Alice) to a second QKD station (Bob). The control signal is detected at Bob and used to stabilize Bob's side of the interferometer against phase variations. The system also includes a polarization control stage (200) that controls (e.g., scrambles) the polarization of the photons entering Bob. The combination of the polarization control and the active phase stabilization of the interferometer at Bob's end allows for the stable operation of the interferometer when used as part of a one-way QKD system.



Declaration under Rule 4.17:

— *of inventorship (Rule 4.17(iv)) for US only*

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.